UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/507,427	09/10/2004	Haim Livne	UEY	6322

22879 7590 02/05/2010

HEWLETT-PACKARD COMPANY
Intellectual Property Administration
3404 E. Harmony Road
Mail Stop 35
FORT COLLINS, CO 80528

EXAMINER	
RAMOS, JAVIER J	
ART UNIT	PAPER NUMBER
2625	

NOTIFICATION DATE	DELIVERY MODE
02/05/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

JERRY.SHORMA@HP.COM
ipa.mail@hp.com
laura.m.clark@hp.com

Office Action Summary	Application No.	Applicant(s)	
	10/507,427	LIVNE, HAIM	
	Examiner	Art Unit	
	JAVIER J. RAMOS	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 November 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10,13-27 and 30-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10,13-27 and 30-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Claims 1-10, 13-27, and 30-33 are pending in this application.

2. Claims 1 and 26 have been amended [11/8/09].

Continued Examination Under 37 CFR 1.114

3. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/8/09 has been entered.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-23 and 26-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fork (US 5,936,657) in view of Florence (US 5,825,400) and Dwyer, III (US 5,016,040).

6. In regards to claim 1, Fork teaches an apparatus for exposing, in a binary manner **(Col. 3, Lines 12-15, each light emitter turns on and off corresponding to a pixel)**, a photoreceptive surface having a width and having relative movement **(Fig. 1, Object 14, "a photoreceptor" with a movement direction of Fig. 1, Object 24)** with an irradiator in a direction perpendicular to the width **(Fig. 1, Object 20, an "LED array"; Fig. 2, Object 25, "printbar")**, comprising: an irradiator comprising a plurality of rows of substantially identical light sources, each said row of light sources having an axis generally directed along said width, said rows being spaced in a direction generally perpendicular to said width to form a generally rectangular array of light sources **(Fig. 1, Object 20; Fig. 2, Object 25; Col. 4, Lines 39-40, "includes 64 rows of pixels extending in the direction of the rotation of the photoreceptor")**; and a controller that controls activation of the light sources to selectively irradiate portions of said photoreceptive surface to form a latent image thereon during said relative motion **(Fig. 1; Col. 3, Lines 21-28, Lines 40-47)**, using fewer than all of the light sources available for illuminating a pixel to be printed **(Col. 3, Lines 40-47, "deactivating all rows of the array except for one selected row")**; wherein the controller is operative to expose pixels along a column of pixels utilizing a light source situated in said column chosen in a random or quasi-random manner **(Col. 3, Lines 40-47, due to the fact that a light row becoming inoperable is a random occurrence, choosing a different operable row as the selected row in response to the random occurrence is**

therefore done in a random manner since it is based off the occurrence of a random event).

However, Fork does not specifically teach wherein the controller controls the activation of the light sources such that at least some pixels in a row are exposed utilizing light sources from different rows of light sources; and wherein the controller controls the light sources such that each of said pixels to be printed that is irradiated is exposed to a same amount of light.

On the other hand, Florence teaches wherein the controller controls the activation of the light sources such that at least some pixels in a row are exposed utilizing light sources from different rows of light sources **(Fig. 4; Col. 8, Lines 9-26, "both image the same scan line306, or the second array 304 maybe be separated, or offset, in the process direction from the first array")**; and wherein the controller controls the light sources such that each of said pixels to be printed that is irradiated is exposed to a same amount of light **(Fig. 9; Col. 12, Lines 41-58; Col. 3, Lines 9-15)**.

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to incorporate the multiple light element imaging process with overlap of Florence into the LED imaging device of Fork because both Florence and Fork teach LED based imaging devices **(Fork: Fig. 1; Florence: Fig. 1)**; further, both teach the use of multiple LED print head elements **(Fork: Col. 3, Lines 40-47; Florence: Figs. 4, 17 and 26)**; and, both are in the same field of endeavor.

Thus, it would have been obvious to incorporate the multiple light element imaging process with overlap of Florence into the LED imaging device of Fork to allow users of Fork to expose pixels with multiple LEDs from different rows of LEDs **(Florence: Fig. 4)**.

It is further noted that Fork, as modified by Florence, does not specifically teach wherein the controller is operative to expose pixels along a column of pixels utilizing a light source in that the light source is randomly selected such that the light source is random.

In analogous art, however, Dwyer teaches wherein the controller is operative to expose pixels along a column of pixels utilizing a light source that the light source is randomly selected such that the light source is random **(Col. 40, Lines 46-57, printing source location chosen in a random fashion amongst multiple sources that are available for a given output pixel)**.

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to select printing sources randomly in the creation of a specific output element (pixel), as taught by Dwyer, in order to reduce tiling problems with respect to printing with multiple printing sources and to minimize the effect of intensity differences between corresponding printing sources for a respective pixel location **(Dwyer: Col. 40, Lines 55-68)**.

7. In regards to claim 2, Florence teaches when rows of pixels to be printed are each illuminated by two rows of light sources, one row of light sources illuminating pixels on one end of a row of pixels and a second row of light

sources illuminating pixels on the other end of the row of pixels, with both rows illuminating pixels in an overlap region of the row of pixels to be printed, wherein light sources outside the overlap region are controlled by said controller such that each of said pixels to be printed that is irradiated is exposed to a same amount of light **(Figs. 17 and 18, show the light sources illuminating different ends of pixels with a distinct overlap region within the row to be printed; Figs. 21-23, show constant illumination along the entire width of pixels; Col. 3, Lines 9-15)**.

8. In regards to claim 3, Florence teaches the light sources comprise light emitting diodes **(Col. 7, Lines 47-60, "LED elements")**.

9. In regards to claim 4, Florence teaches each row of said plurality of rows of light sources are on a different print head **(Figs. 4 and 17)**.

10. In regards to claim 5, Fork teaches more than one of said plurality of rows of light sources are on a single print head **(Col. 4, Lines 39-48, "64 rows of pixels")**.

11. In regards to claim 6, Fork teaches all of said plurality of rows of light sources are on a single print head **(Col. 4, Lines 39-48, "64 rows of pixels")**.

12. In regards to claim 7, Fork teaches at least two of said plurality of rows are formed on a monolithic substrate **(Col. 4, Line 6, "printbars on a substrate")**.

13. In regards to claim 8, Florence teaches said plurality of rows comprises fewer than four rows **(Fig. 2)**.

14. In regards to claim 9, Fork teaches said plurality of rows comprises between five and nine rows **(Fig. 3, shows five rows)**.

15. In regards to claim 10, Fork teaches said plurality of rows comprises ten or more rows **(Col. 4, Lines 39-48, "64 rows of pixels")**.

16. In regards to claim 13, Fork teaches the light sources from which the exposing light sources are chosen, comprise a set of light sources, chosen to minimize artifacts **(Col. 3, Lines 40-47, "inoperable" rows that would cause artifacts are deactivated and a new fully operable row is chosen)**.

17. In regards to claim 14, Florence teaches said controller is operative to expose pixels along a column of pixels utilizing a plurality of light sources situated in said column **(Figs. 17 and 18, show the light sources illuminating different ends of pixels with a distinct overlap region within the row to be printed; Figs. 21-23, show constant illumination along the entire width of pixels; Col. 3, Lines 9-15)**.

18. In regards to claim 15, Florence teaches a motor that provides motion of said photoreceptor **(Fig. 1; Col. 6, Lines 24-30, "rotating photosensitive drum")**.

19. In regards to claim 16, Fork teaches a position sensor that provides an indication of position of said photoreceptor with respect to said rows of light sources **(Fig. 1, Object 12, "position encoder"; Col. 4, Lines 31-38)**.

20. In regards to claim 17, Florence teaches said controller activates said light sources, responsive to said indication of position **(Col. 6, Lines 45-48, "light 106 is selectively incident on the drum")**.

21. In regards to claim 18, Florence teaches the photoreceptive surface is a charged photoconductive surface and wherein exposure to light of the light sources selectively discharges the surface **(Col. 6, Lines 24-44, to "create a latent image, portions of the drum 102 are selectively exposed to light 106 causing those portions to become electrically conductive")**.

22. In regards to claim 19, Florence teaches a developer that develops the latent image with a colored toner to form a developed image thereon **(Col. 6, Lines 24-44, "latent image")**; and a transfer station at which said developed

image is transferred to a final substrate **(Fig. 1; Col. 6, Lines 46-65, "a fuser 114 melts the toner, causing it to fuse to the paper")**.

23. In regards to claim 20, Florence teaches the colored toner is a powdered toner **(Col. 6, Lines 46-65, a process of melting the powdered toner to fuse it to the paper).**

24. In regards to claim 21, Florence teaches the colored toner is a liquid toner **(Col. 6, Lines 5-10, "droplets of ink")**.

25. In regards to claim 22, Florence teaches wherein exposure from said light sources forms a latent image in said photoreceptive surface that can be chemically developed to form a visible image **(Col. 6, Lines 13-17, "photographic print processes"; Col. 6, Lines 24-44, to "create a latent image, portions of the drum 102 are selectively exposed to light 106 causing those portions to become electrically conductive")**.

26. In regards to claim 23, Florence teaches a latent image forming device **(Fig. 1)**; and a developer that chemically develops the latent image to form a visible image **(Col. 6, Lines 13-17, "photographic print processes")**.

27. In regards to claim 26, Florence teaches a method of pixelized image formation on a photosensitive surface **(Fig. 1; Col. 6, Lines 24-65)**, comprising:

providing relative motion of the photosensitive surface relative to a multiplicity of light sources **(Fig. 1, Object 118, the direction of movement of the drum (102) in relation to the imaging device (116))**, such that pixels to be printed on the surface pass a plurality of said light sources **(Figs. 4 and 17, show multiple light sources)**; and exposing a plurality of the pixels to be printed of the surface to more than one of said light sources **(Figs. 4 and 17, show multiple light sources)**, characterized in that the exposure of the exposed pixels to be printed is the same **(Fig. 9; Col. 12, Lines 41-58; Col. 3, Lines 9-15)**; wherein at least one pixel is exposed to one or more of the light sources chosen randomly or quasi-randomly **(Col. 3, Lines 40-47, due to the fact that a light row becoming inoperable is a random occurrence, choosing a different operable row as the selected row in response to the random occurrence is therefore done in a random manner since it is based off the occurrence of a random event)**.

It is noted however that Florence does not specifically teach exposing a plurality of the pixels to be printed of the surface to more than one, but fewer than the plurality, of said light sources.

On the other hand, Fork teaches exposing a plurality of the pixels to be printed of the surface to fewer than the plurality of said light sources **(Col. 3, Lines 40-47)**.

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to combine the LED imaging device of Fork with the multiple light element imaging process with overlap of Florence because both Florence and Fork teach LED based imaging devices **(Fork: Fig. 1; Florence: Fig. 1)**; further,

both teach the use of multiple LED print head elements **(Fork: Col. 3, Lines 40-47; Florence: Figs. 4, 17 and 26)**; and, both are in the same field of endeavor.

It is further noted that Fork, as modified by Florence, does not specifically teach exposing at least one of the plurality of pixels to one or more of the light sources chosen randomly or quasi-randomly, in that the light source is randomly selected such that the light source is random.

In analogous art, however, Dwyer teaches exposing at least one of the plurality of pixels to one or more of the light sources chosen randomly or quasi-randomly, in that the light source is randomly selected such that the light source is random **(Col. 40, Lines 46-57, printing source location chosen in a random fashion amongst multiple sources that are available for a given output pixel)**.

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to select printing sources randomly in the creation of a specific output element (pixel), as taught by Dwyer, in order to reduce tiling problems with respect to printing with multiple printing sources and to minimize the effect of intensity differences between corresponding printing sources for a respective pixel location **(Dwyer: Col. 40, Lines 55-68)**.

28. In regards to claim 27, Florence teaches when rows of pixels to be printed are each illuminated by two rows of light sources, one row of light sources illuminating pixels on one end of a row of pixels and a second row of light sources illuminating pixels on the other end of the row of pixels, with both rows

illuminating pixels in an overlap region of the row of pixels to be printed, wherein light sources outside the overlap region are exposed to a same amount of light **(Figs. 17 and 18, show the light sources illuminating different ends of pixels with a distinct overlap region within the row to be printed; Figs. 21-23, show constant illumination along the entire width of pixels; Col. 3, Lines 9-15)**.

29. In regards to claim 30, Florence teaches a plurality of pixels are exposed in accordance with the method **(Fig. 1; Col. 6, Lines 24-65)**.

30. In regards to claim 31, Florence teaches the image thus formed is a latent image and including developing the latent image to form a visible image **(Col. 6, Lines 24-44, to "create a latent image, portions of the drum 102 are selectively exposed to light 106 causing those portions to become electrically conductive")**.

31. In regards to claim 32, Florence teaches said developing comprises contacting the surface with a toner **(Col. 6, Lines 46-65, "surface then rotates past a toner supply")**.

32. In regards to claim 33, Florence teaches developing comprises chemical development **(Col. 6, Lines 13-17, "photographic print processes")**.

33. Claims 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fork (US 5,936,657) in view of Florence (US 5,825,400) and Dwyer, III (US 5,016,040), as applied to claim 1, further in view of Vergona (US 5,764,183).

34. In regards to claim 24, Fork, as modified by Florence and Dwyer, teaches a latent image forming devices **(Florence: Col. 6, Lines 13-17, "photographic print processes"; Col. 6, Lines 24-44, to "create a latent image, portions of the drum 102 are selectively exposed to light 106 causing those portions to become electrically conductive")**; and a developer that chemically develops the latent image to form a visible image **(Florence: Col. 6, Lines 13-17, "photographic print processes")**.

It is noted however that Fork, as modified by Florence, does not specifically teach a plurality of latent image forming devices; each said device emitting light of a different color.

On the other hand, Vergona teaches a plurality of latent image forming devices for a photosurface **(Col. 1, Lines 51-52, "LED's for forming color images on a photosensitive surface")**; each said device emitting light of a different color **(Abstract; Col. 1, Lines 51-52)**.

It would have been obvious to one of ordinary skill in the art to incorporate the multicolor image forming apparatus of Vergona into the LED image forming apparatus of Fork, as modified by Florence, because both Fork, as modified by Florence, and Vergona teach the creation of latent images on photosensitive

surfaces **(Florence: Col. 6, Lines 24-44; Vergona: Col. 1, Lines 50-55)**, further, both use LEDs to form the latent images **(Florence: Col. 7, Lines 47-60; Vergona: Abstract)**; and, both are in the same field of endeavor.

Thus, it would have been obvious to incorporate the multicolor image forming apparatus of Vergona into the LED image forming apparatus of Fork, as modified by Florence, to allow users of Fork, as modified by Florence, to produce multi-colored images using different colored LEDs **(Vergona: Col. 1, Lines 51-52)**.

35. In regards to claim 25, Vergona teaches the colors include red, green and blue **(Abstract; Col. 1, Lines 51-52)**.

Response to Arguments

36. Applicant's arguments with respect to claims 1-10, 13-27, and 30-33 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

37. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. US 7,066,570 B1 – Col. 6, Lines 11-26: teaching the masking of faults caused by specific printing elements within an element array by randomly selecting certain printing elements of the array in printing of an image.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAVIER J. RAMOS whose telephone number is (571) 270-3947. The examiner can normally be reached on Monday to Thursday - 9 am to 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark K. Zimmerman can be reached on (571) 272-7653. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Javier J Ramos/
Examiner, Art Unit 2625

/Mark K Zimmerman/
Supervisory Patent Examiner, Art Unit 2625